

# ABSTRACT OF THE DISCLOSURE

Conductive polymer films are formed on the surfaces of a substrate made of a metal material by, preferably, electrolytic polymerization. Alternatively, passive-state layers are  
5 formed on the surfaces of a substrate and conductive polymer films are formed on the passive-state layers. It is desirable to form groove-like gas flow passages by bending the substrate before the execution of electrolytic polymerization or the formation of passive-state layers. In the electrolytic  
10 polymerization, it is desirable that electrolysis be performed by using the substrate as an electrolytic polymerization electrode. Therefore, a metal separator having conductive polymer coatings that are superior in contact resistance and corrosion resistance can be obtained. The manufacturing cost  
15 of a polymer electrolyte fuel cell can be reduced.